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FIGURE 1

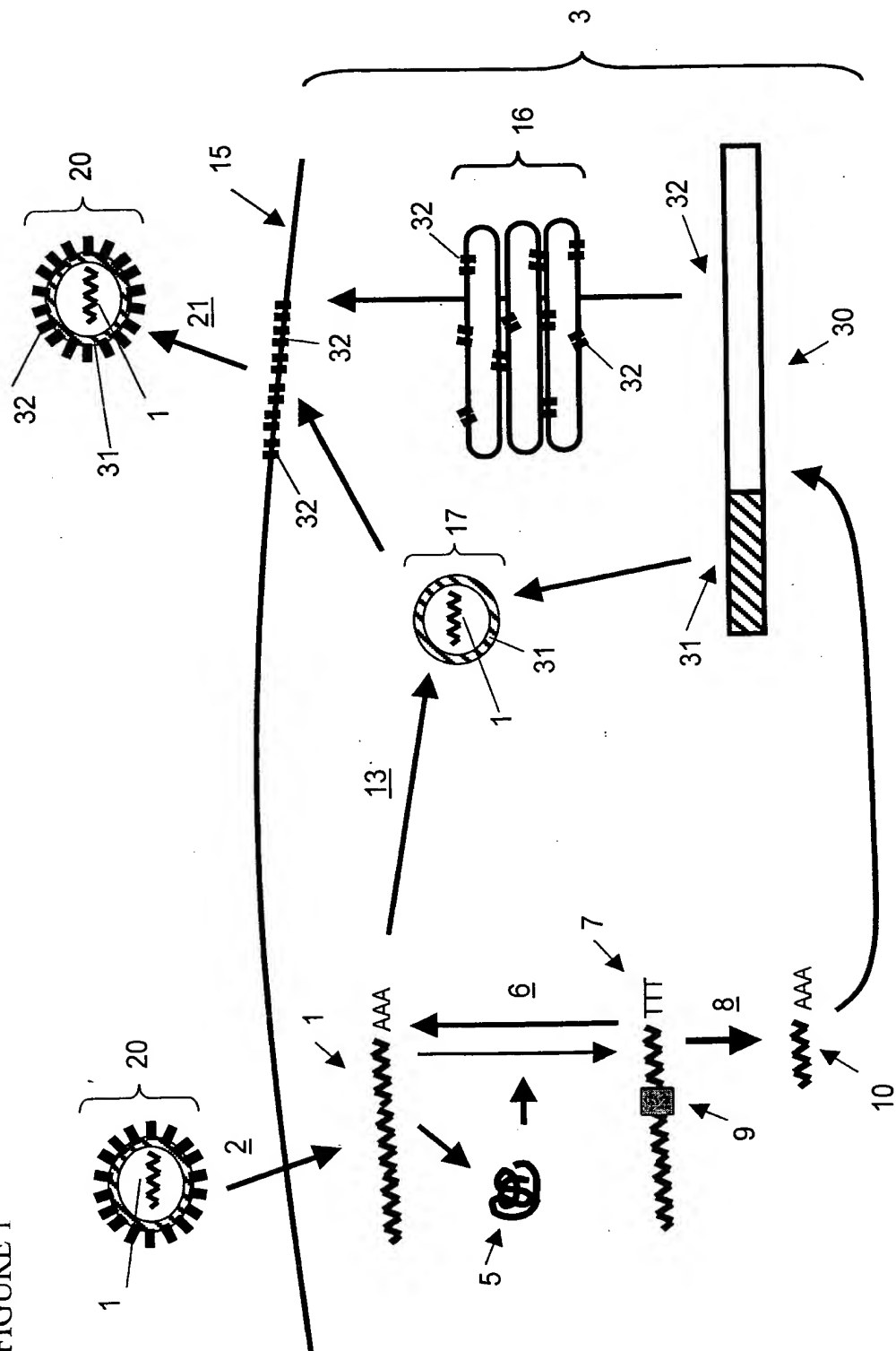


FIGURE 2

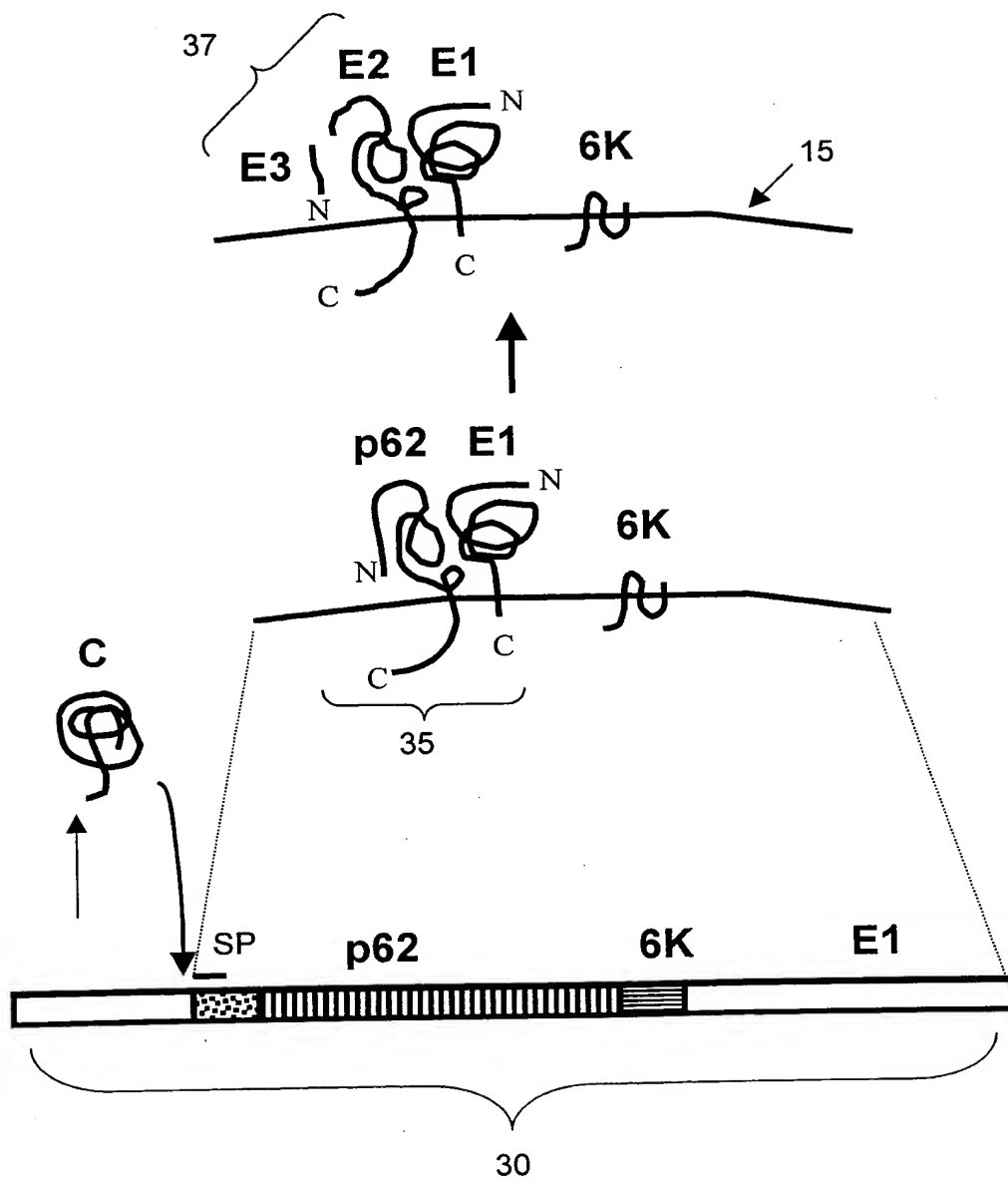
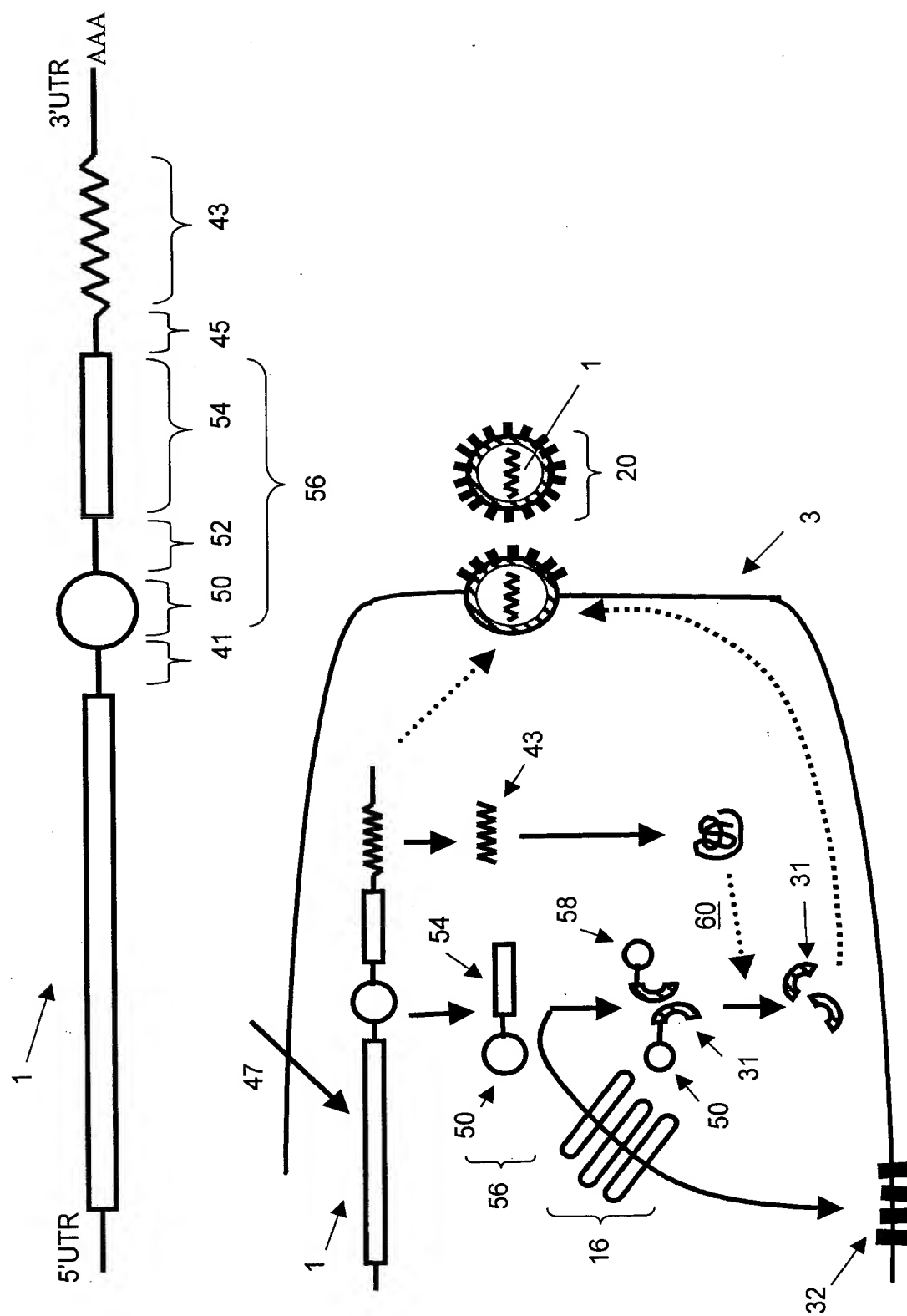




FIGURE 3B



The diagram illustrates a genetic circuit for a self-replicating virus. At the top, a linear genome is shown with a 5'UTR, a 3'UTR, and an AAA domain. The genome is divided into segments labeled 1, 20, 30, 41, 43, 45, and 47. The 3'UTR and AAA domain are indicated by brackets. Below the genome, a virus particle (1) is shown, which is a spherical structure with a wavy outer layer and a central core. The virus particle is shown in two states: one as a whole particle and another as a disassembled structure showing the genome (3) and the packaging machinery (66). The packaging machinery (66) is a complex of proteins, including a capsid (64) and a tail (68). The virus particle is shown infecting a host cell (47), which is a rectangular structure with a wavy outer layer. The host cell contains a replication origin (43) and a packaging signal (45). The virus particle is shown injecting its genome (3) into the host cell. The genome (3) is then replicated and packaged into new virus particles (1). The diagram shows the cycle of self-replication and infection.

$\{f_{11}^{(2)}\}$   $\{f_{12}^{(2)}\}$   $\{f_{13}^{(2)}\}$   $\{f_{14}^{(2)}\}$   $\{f_{15}^{(2)}\}$   $\{f_{16}^{(2)}\}$   $\{f_{17}^{(2)}\}$   $\{f_{18}^{(2)}\}$   $\{f_{19}^{(2)}\}$   $\{f_{20}^{(2)}\}$   
 $\{f_{21}^{(2)}\}$   $\{f_{22}^{(2)}\}$   $\{f_{23}^{(2)}\}$   $\{f_{24}^{(2)}\}$   $\{f_{25}^{(2)}\}$   $\{f_{26}^{(2)}\}$   $\{f_{27}^{(2)}\}$   $\{f_{28}^{(2)}\}$   $\{f_{29}^{(2)}\}$   $\{f_{30}^{(2)}\}$   
 $\{f_{31}^{(2)}\}$   $\{f_{32}^{(2)}\}$   $\{f_{33}^{(2)}\}$   $\{f_{34}^{(2)}\}$   $\{f_{35}^{(2)}\}$   $\{f_{36}^{(2)}\}$   $\{f_{37}^{(2)}\}$   $\{f_{38}^{(2)}\}$   $\{f_{39}^{(2)}\}$   $\{f_{40}^{(2)}\}$   
 $\{f_{41}^{(2)}\}$   $\{f_{42}^{(2)}\}$   $\{f_{43}^{(2)}\}$   $\{f_{44}^{(2)}\}$   $\{f_{45}^{(2)}\}$   $\{f_{46}^{(2)}\}$   $\{f_{47}^{(2)}\}$   $\{f_{48}^{(2)}\}$   $\{f_{49}^{(2)}\}$   $\{f_{50}^{(2)}\}$   
 $\{f_{51}^{(2)}\}$   $\{f_{52}^{(2)}\}$   $\{f_{53}^{(2)}\}$   $\{f_{54}^{(2)}\}$   $\{f_{55}^{(2)}\}$   $\{f_{56}^{(2)}\}$   $\{f_{57}^{(2)}\}$   $\{f_{58}^{(2)}\}$   $\{f_{59}^{(2)}\}$   $\{f_{60}^{(2)}\}$   
 $\{f_{61}^{(2)}\}$   $\{f_{62}^{(2)}\}$   $\{f_{63}^{(2)}\}$   $\{f_{64}^{(2)}\}$   $\{f_{65}^{(2)}\}$   $\{f_{66}^{(2)}\}$   $\{f_{67}^{(2)}\}$   $\{f_{68}^{(2)}\}$   $\{f_{69}^{(2)}\}$   $\{f_{70}^{(2)}\}$   
 $\{f_{71}^{(2)}\}$   $\{f_{72}^{(2)}\}$   $\{f_{73}^{(2)}\}$   $\{f_{74}^{(2)}\}$   $\{f_{75}^{(2)}\}$   $\{f_{76}^{(2)}\}$   $\{f_{77}^{(2)}\}$   $\{f_{78}^{(2)}\}$   $\{f_{79}^{(2)}\}$   $\{f_{80}^{(2)}\}$   
 $\{f_{81}^{(2)}\}$   $\{f_{82}^{(2)}\}$   $\{f_{83}^{(2)}\}$   $\{f_{84}^{(2)}\}$   $\{f_{85}^{(2)}\}$   $\{f_{86}^{(2)}\}$   $\{f_{87}^{(2)}\}$   $\{f_{88}^{(2)}\}$   $\{f_{89}^{(2)}\}$   $\{f_{90}^{(2)}\}$   
 $\{f_{91}^{(2)}\}$   $\{f_{92}^{(2)}\}$   $\{f_{93}^{(2)}\}$   $\{f_{94}^{(2)}\}$   $\{f_{95}^{(2)}\}$   $\{f_{96}^{(2)}\}$   $\{f_{97}^{(2)}\}$   $\{f_{98}^{(2)}\}$   $\{f_{99}^{(2)}\}$   $\{f_{100}^{(2)}\}$

FIGURE 4A

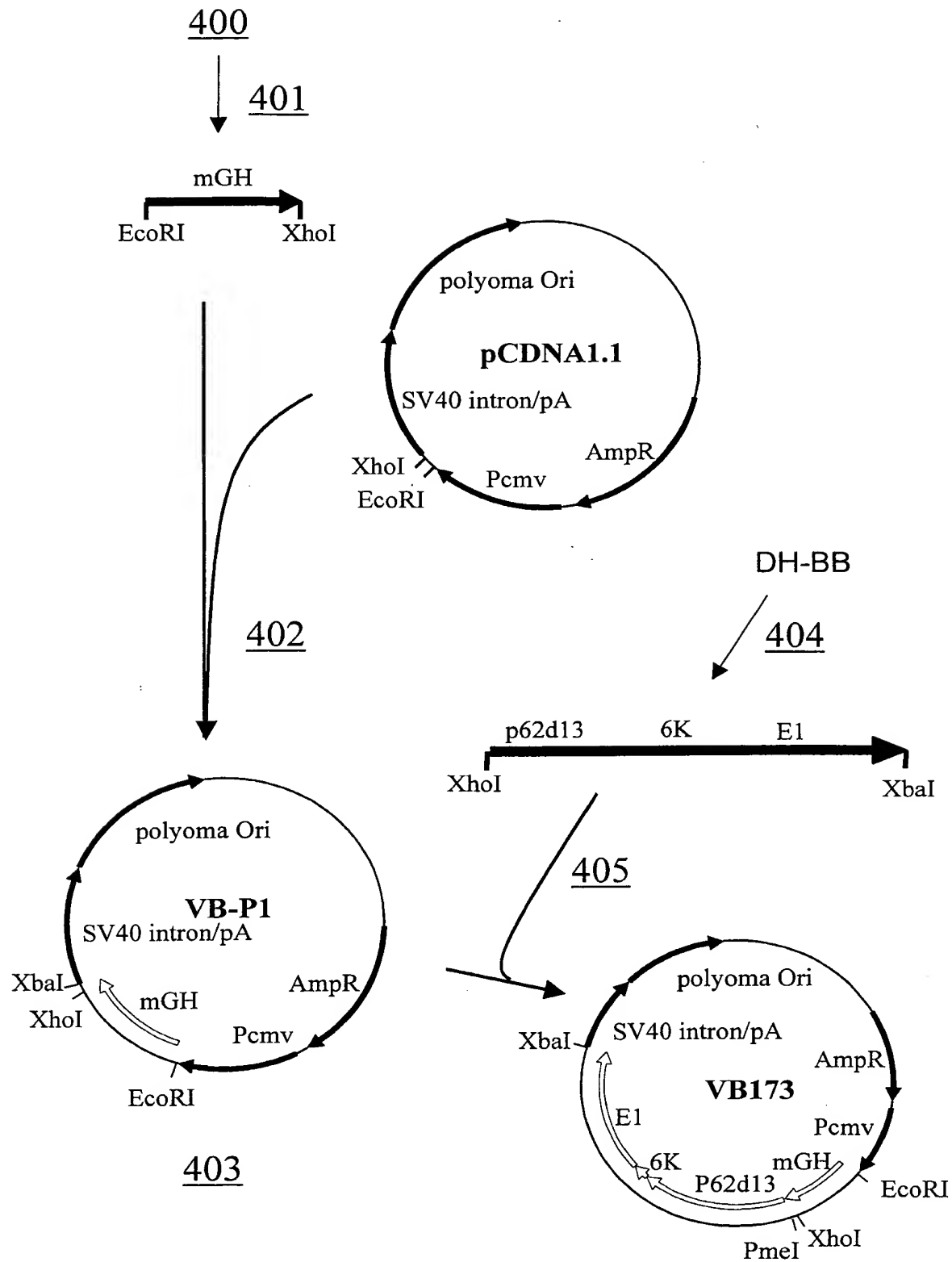


FIGURE 4B

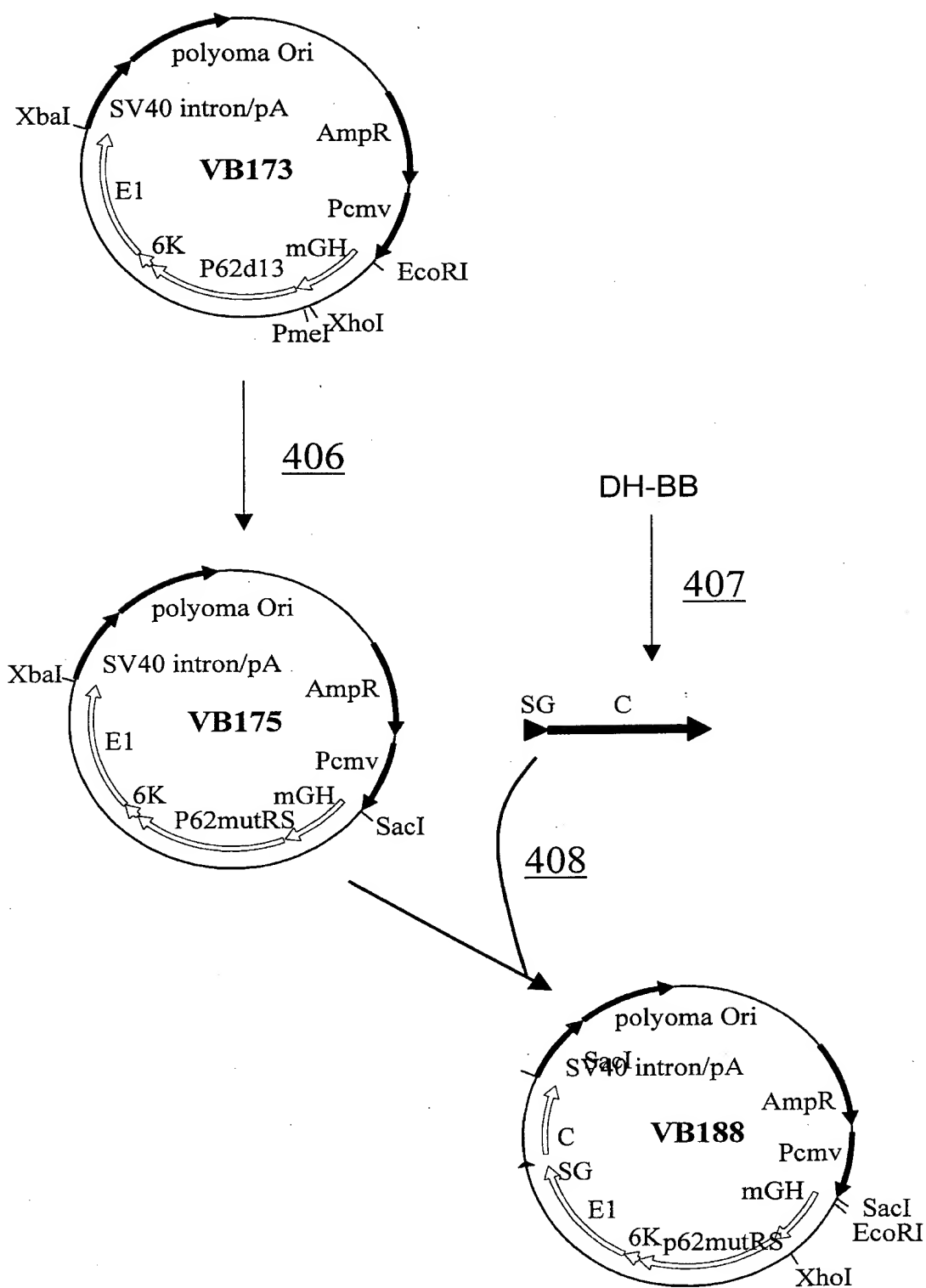




FIGURE 4C

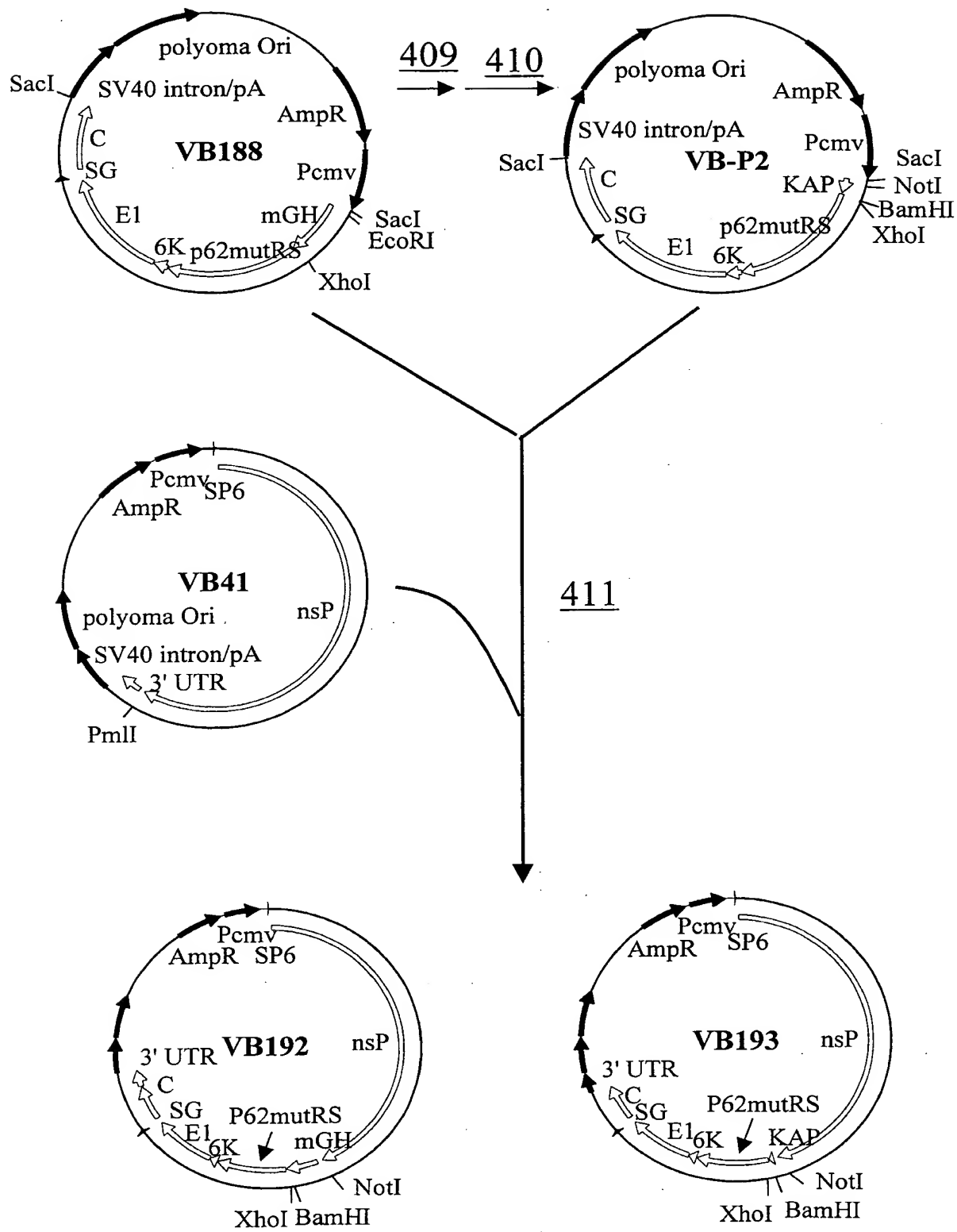


FIGURE 4D

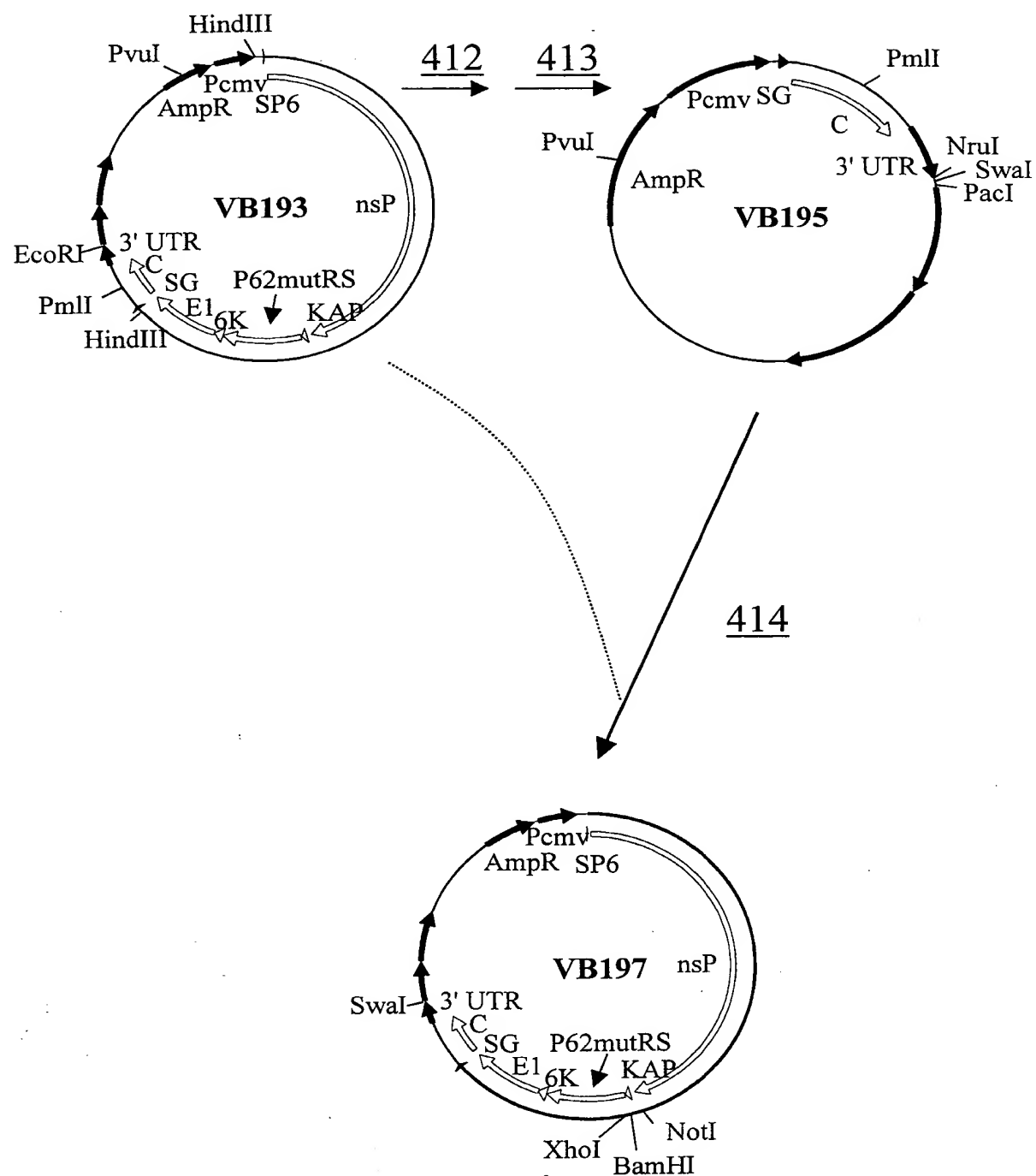


FIGURE 5A

	NotI	BamHI
...	tcgatcegaattc	GCGGCCGC
tctatt	GGATCC	tcgagcaga
TCT	GCA	GCA ...

S<sub>1</sub>

A<sub>2</sub>

A<sub>3</sub>

E1

FIGURE 5B

R<sub>439</sub>

\*

AGA TGA atcaagcttatcgataccgctcgagcatgcatctagggtg  
tccaagccatcagaggggaataaagcattctctacgggtgcctaaatagtcagcatagt acatttcctcigactaatactacaacaccaccacc ATG AAT AGA

Met<sub>1</sub>

N<sub>2</sub>

R<sub>3</sub>

C

SG2 (-46/+14)

FIGURE 5C

...GAG TGG TCC GCA TGG TGA.....

E<sub>263</sub>

W<sub>264</sub>

S<sub>1</sub>

A<sub>2</sub>

W

\*

C

↑

FIGURE 5D

...(A)<sub>32</sub>ggggaatttcggATTAAATt...

Swal

FIGURE 5E

WT p62	S	A	A	P	L	V	T	A	M	C	L	L	G	N	V	S
	tct	gca	gca	cca	ctg	gtc	acg	gca	atg	tgt	ttg	cfc	gga	aat	gfg	agc
											↓	↓				
p62mutRS	S	A	A	P	L	V	T	A	M	C	R	S	G	N	V	S
	tct	gca	gca	cca	ctg	gtc	acg	gca	atg	tgt	cgg	agg	gga	aat	gfg	agc

FIGURE 6

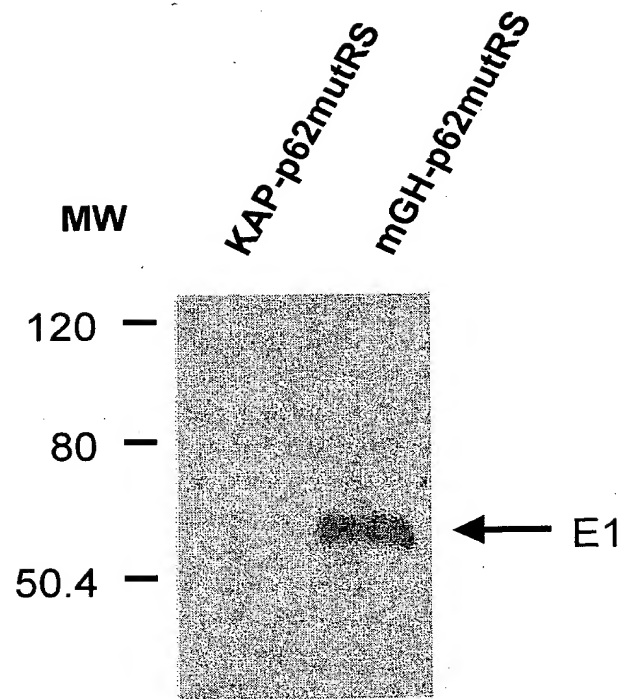


FIGURE 7

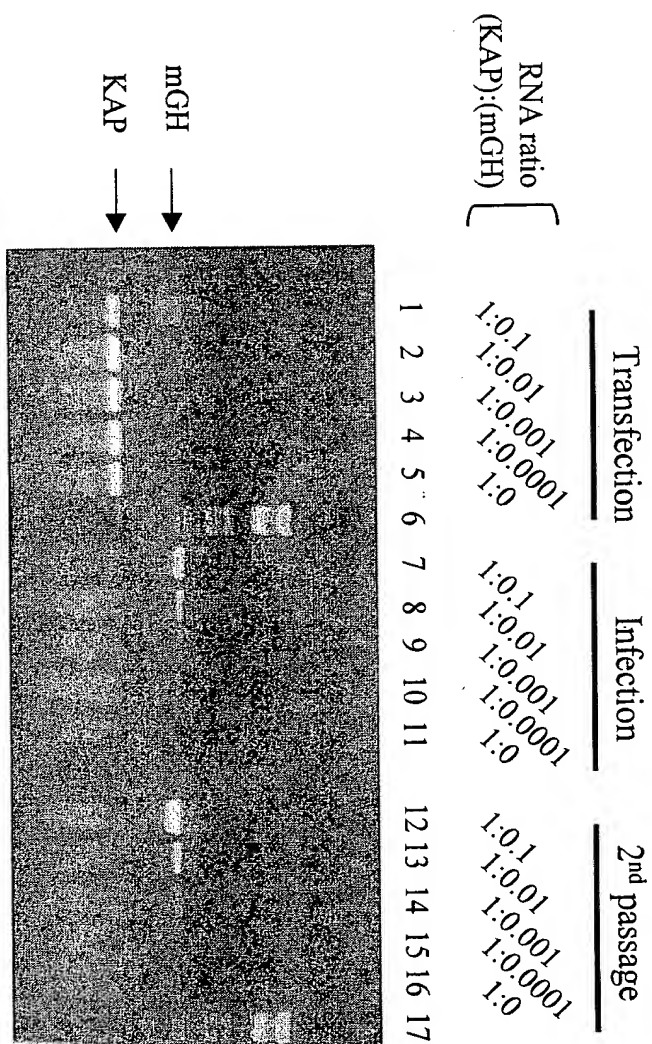


FIGURE 8A

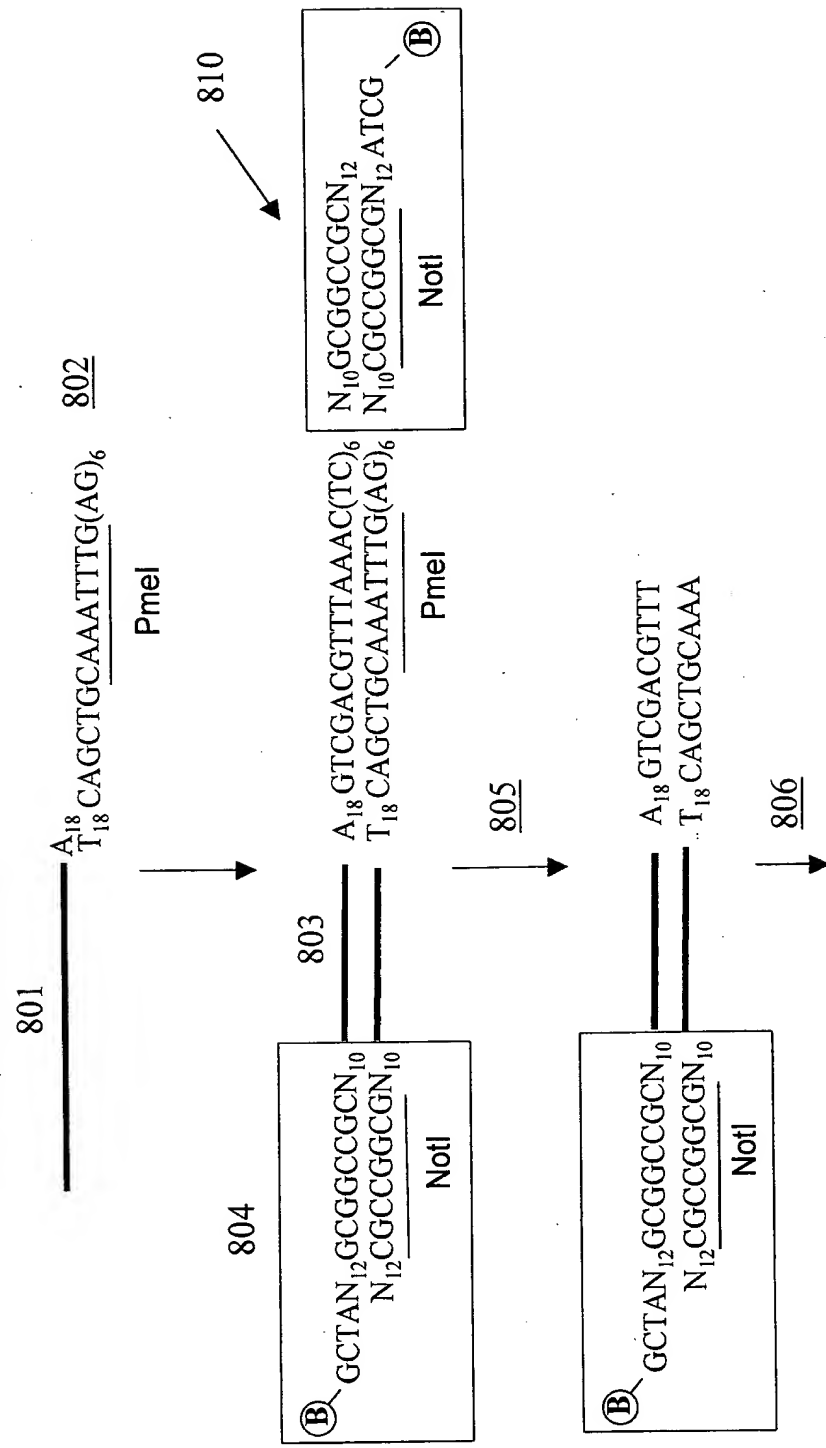


FIGURE 8B

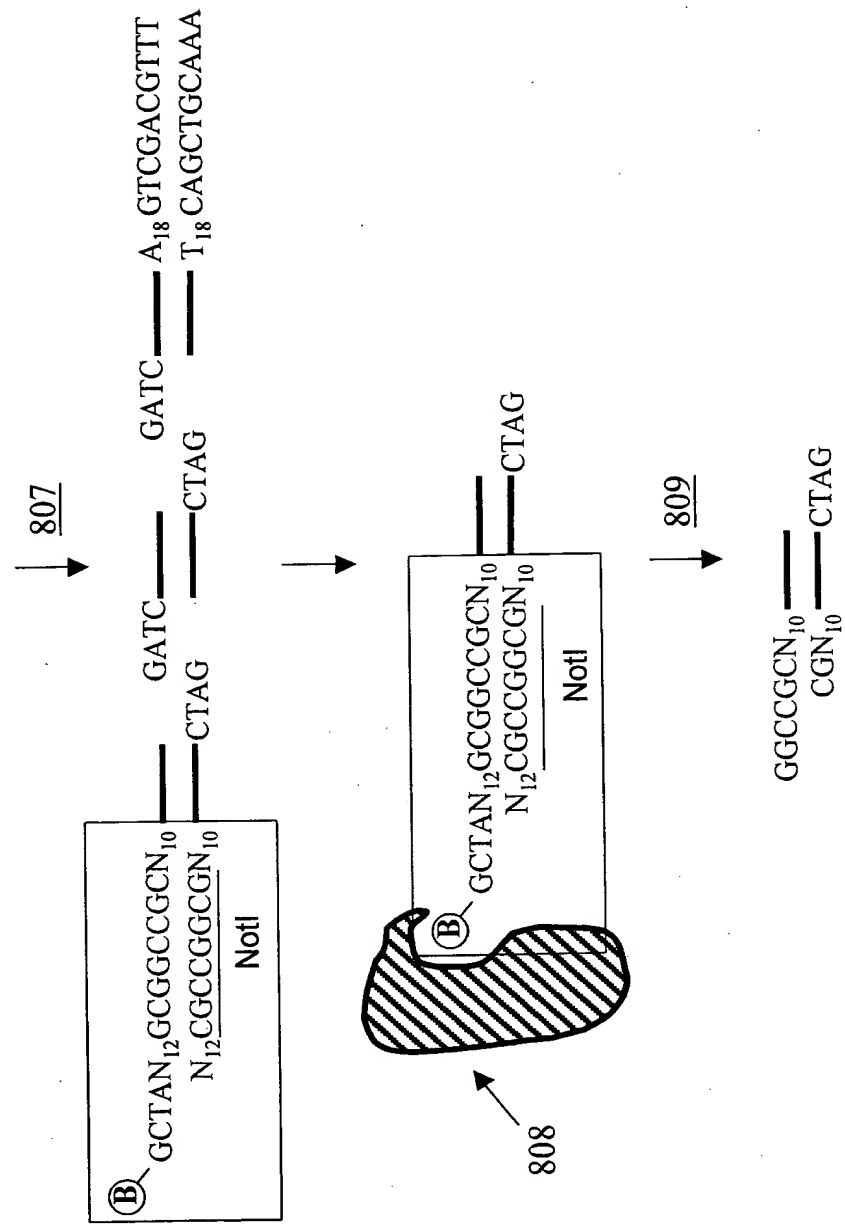


FIGURE 9A

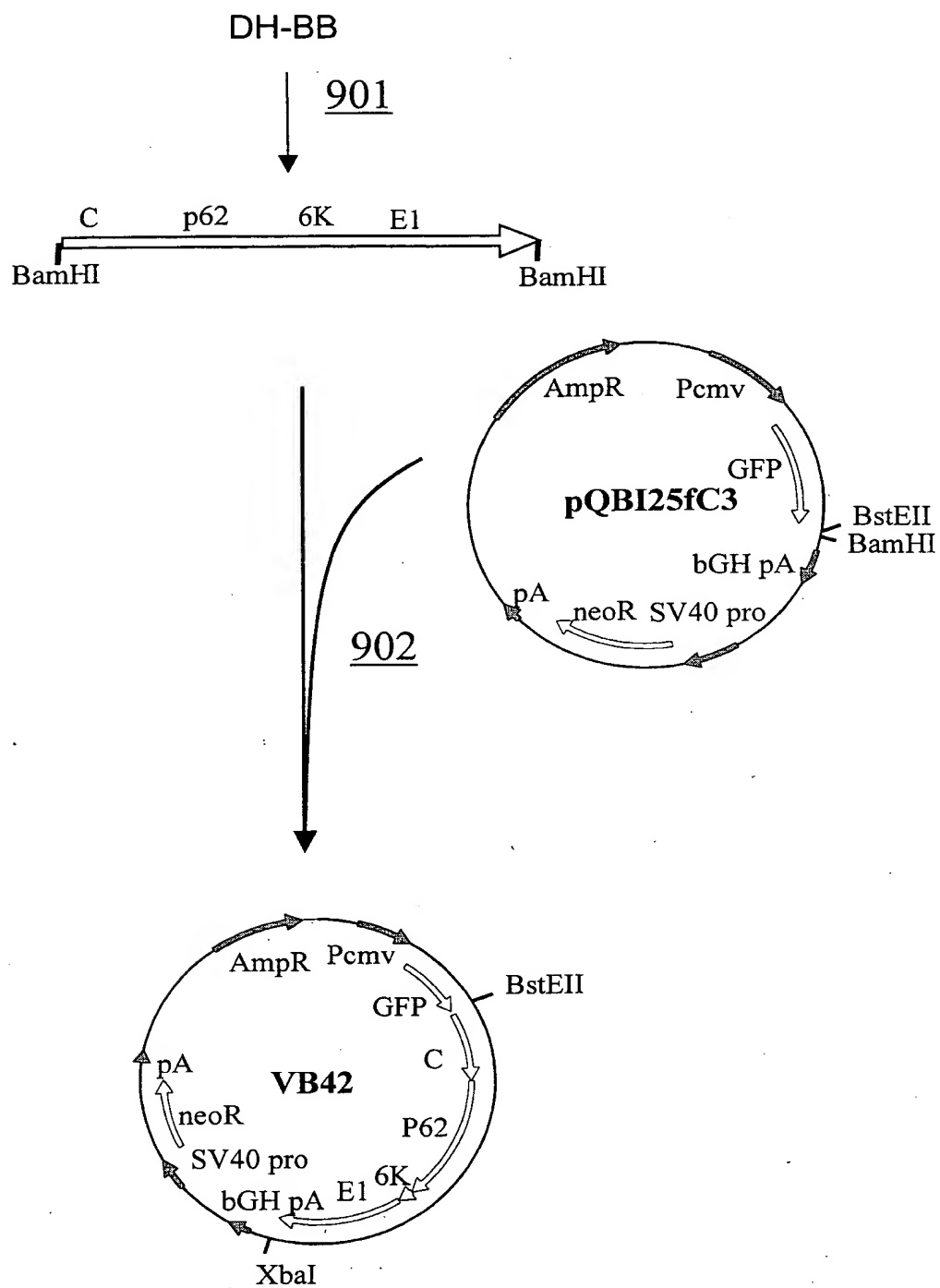




FIGURE 9B

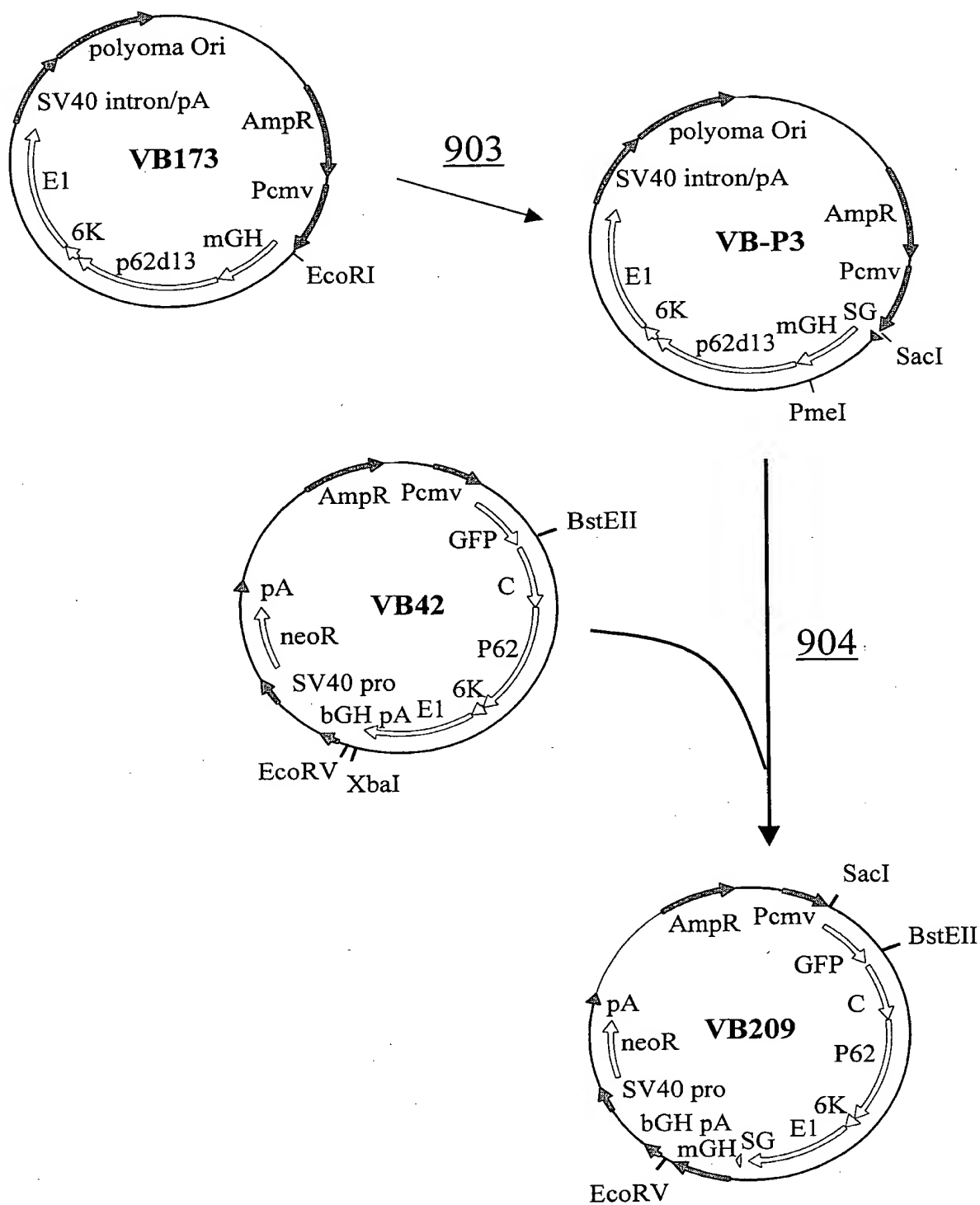


FIGURE 9C

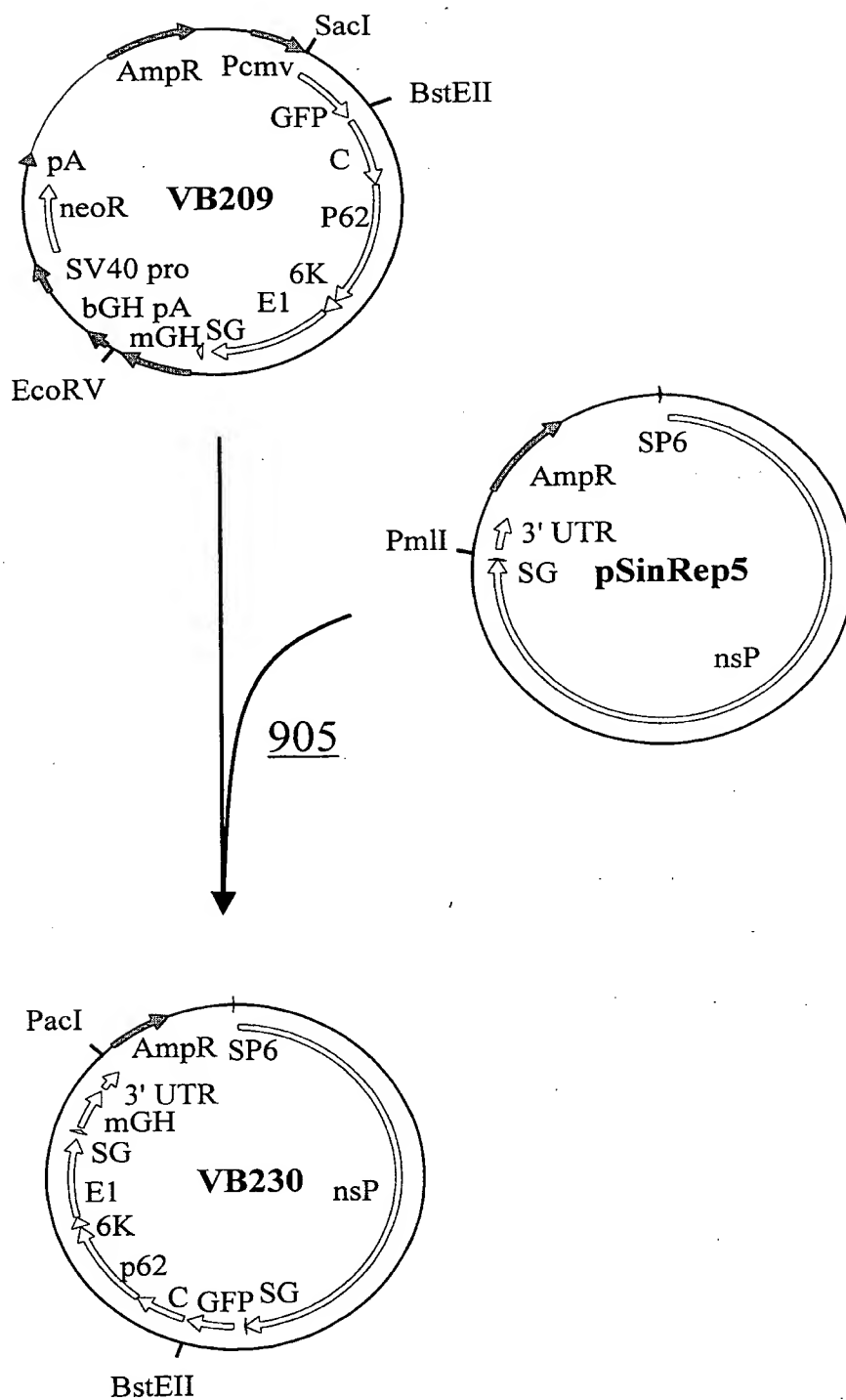


FIGURE 10A

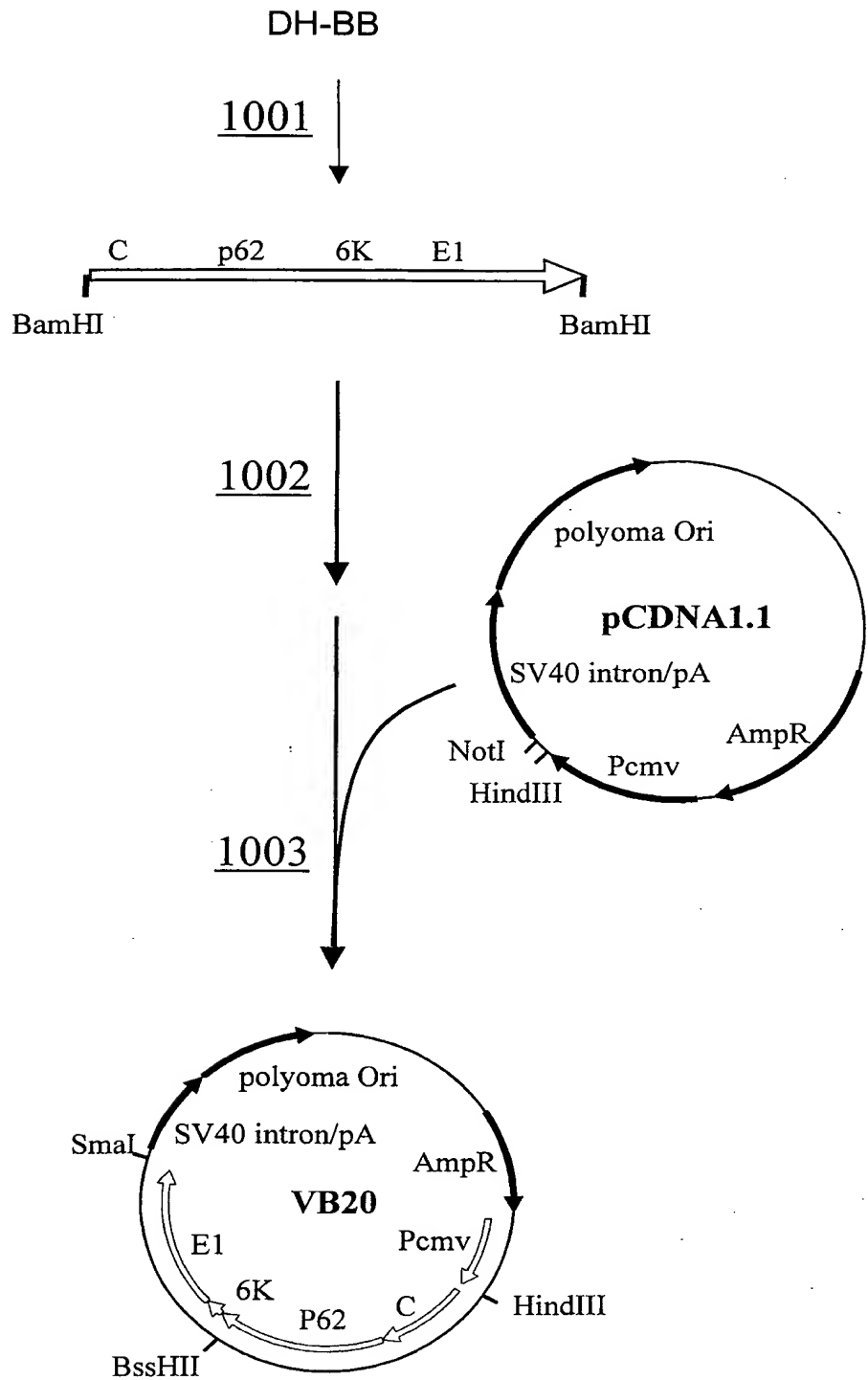


FIGURE 10B

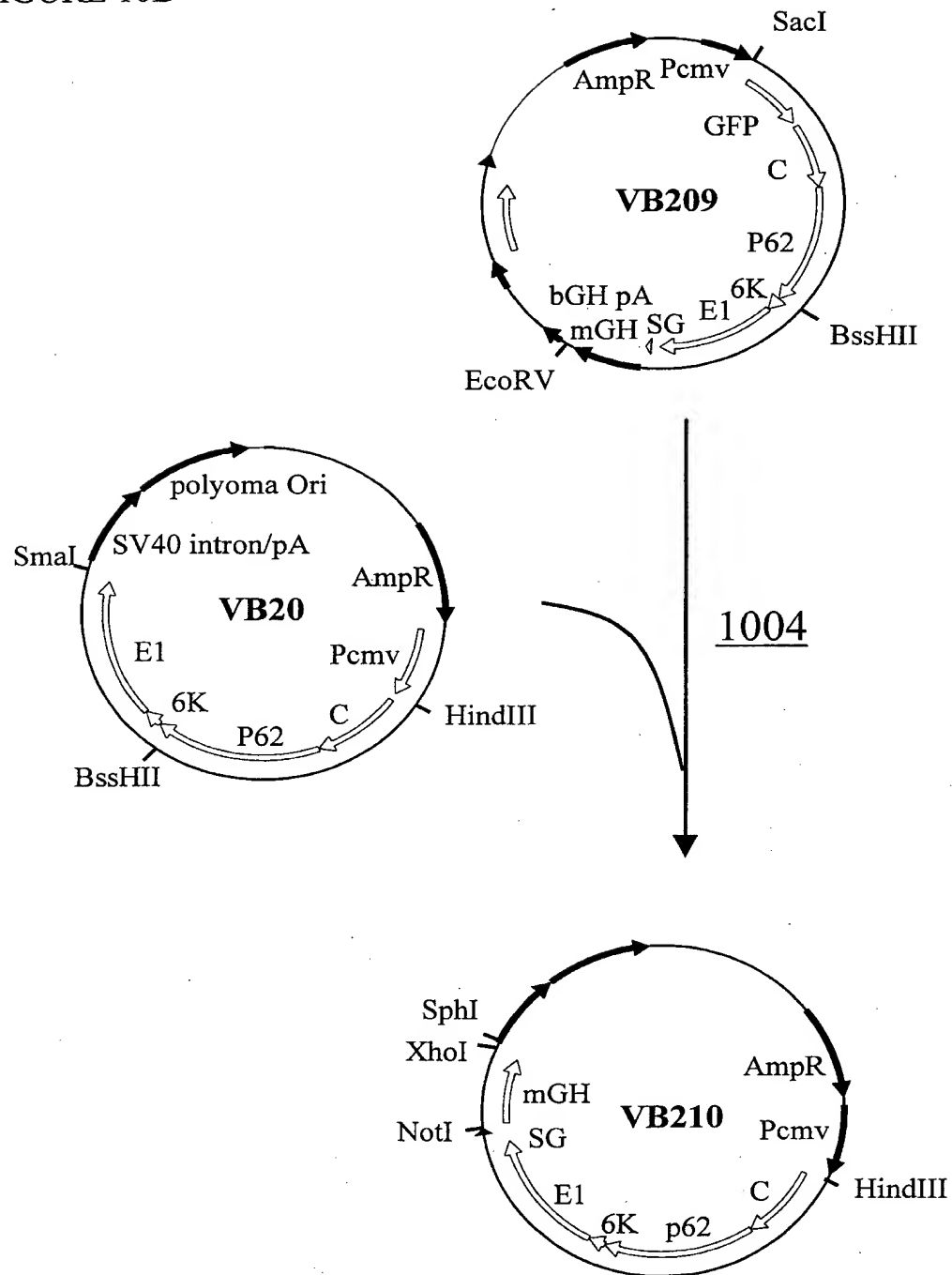


FIGURE 10C

